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The amplitudes of the waves give a measure of the principal agent of the dynamical phenomena which regulate the whole system of variations.

I conclude, therefore, by saying that the examination of the annual means of atmospheric pressure observed in the different localities of the United States confirm the principal result of my researches on the variations of the annual means of temperature. That is to say, there exists a dynamical climatology, and the study of the dynamics of climates is perfectly possible.

GEOGRAPHICAL RECORD

AMERICA

MR. JOCHELSON'S FINDS ON ATTU ISLAND. The departure of Mr. Waldemar Jochelson and his wife for the Aleutian Islands, for ethnological studies, was reported in the *Bulletin* (Vol. 40, 1908, p. 753). Some details of his work on Attu Island, the most eastern of our Aleutian possessions, are printed in *Globus* (Vol. 97, 1910, p. 99) from a short report he has sent to St. Petersburg. He has made many excavations and found numerous dwelling places affording much evidence as to the development of material culture among the ancient Aleuts. His collections number 250 specimens, among which are many stone and bone carvings, 13 skulls, a complete skeleton, stone and bone lances and arrow heads, and baskets and other objects woven by women from grass. This grass weaving shows great skill and fine technic. He has also specimens of edible plants and roots, fibers, and 50 phonographic cylinders on which he took folk lore and songs of the Aleuts. He has written his descriptive text, secured a large vocabulary and prepared a grammar of the native speech. He believes that his further work on the Aleutian Islands will have much importance for primitive culture. In the seventh decade of the last century, Dr. Dall made excavations on these islands and Jochelson has been able to verify some of his observations, but he reports that Dall was mistaken in many of his conclusions. The explorer expected to spend last winter on Umnak Island and to carry his collections in April, this year, to Unalaska.

AGRICULTURE AND IRRIGATION IN BRAZIL. It is a sign of industrial health that Brazil has become interested in mixed farming and the possibilities of irrigation. Mixed farming is highly desirable in view of the depression caused by the drop in the coffee market on account of over-production. Attention is called in government reports to the possibilities in rice production, Brazil being one of the great rice consuming countries; and a fair start has been made in this industry on a scientific basis. Wheat production has also been encouraged to a notable extent and the industry is capable of great development. More recently, great activity has been displayed in the irrigation projects of the arid states of Ceara, Parahyba, and Rio Grande del Norte, the government sending a commission to the United States to study our irrigation projects and problems. The provinces in point (*Daily Consular and Trade Reports*, No. 3675, Jan. 3, 1910) have long been known for their severe drought. They lie along the coast

northwest of Cape San Roque where the direction of the prominent topographic features corresponds to the direction of the prevailing trades with the result that but little water is precipitated, in contrast to the abundantly watered coast southwest of Cape San Roque toward Rio Janeiro. A new law makes provision for the construction of dams and reservoirs, wells, river dikes, sea walls for the reclamation of low-lying and wet coastal lands, and highways and railways from the coast to the interior to furnish cheap transportation facilities and enable the sphere of cultivation to be extended much farther than at present. A scientific study is also being made of the geological, topographic, and meteorological conditions and effort is also being made to conserve forest resources and to begin reforestation. The national government assists the individual state only upon condition that at least 5 per cent. of the annual receipts of the state government are spent in ameliorating the conditions due to drought.

ISAIAH BOWMAN.

ASIA

KOSLOFF'S EXPEDITION IN CENTRAL ASIA. The first year's work of this Russian expedition resulted in some interesting finds. Entering northern Mongolia from Kiakhta, Kosloff found, near the ancient channel of the Etsin-gol, a river that rises in the Nan Shan range and flows into the Gobi Desert, the sand-covered ruins of a former city. Excavations yielded many documents, coins, household articles, etc., which were sent to St. Petersburg where experts found, on examination, that the city flourished between the 11th and 14th centuries. Later, Col. Kosloff spent three weeks on the southern shores of Koko Nor, the famous lake of northeastern Tibet, taking scientific observations and studying the hydrography of the region. Its coast line measures about 230 miles, and it is subject to sudden and violent storms. Two members of the scientific staff visited the island of Kuisu, the first Europeans who have reached it, though many pilgrims go to the island in winter, on the ice. Three monks were found there, each living in his own cave and with his own flock of sheep and goats. A temple stands there. The greatest depth of the lake, shown by the soundings, was 120 feet, near Kuisu. Col. Kosloff says the lake is slowly shrinking and the natives there report that the island of Kuisu has grown perceptibly larger in the past generation.

Detached parties explored a considerable area on both sides of Kosloff's route. A hitherto unknown corner of the Chinese province of Kansu was visited and the positions of 9 new towns were fixed. A full report of the first year of Kosloff's work appears in the *Geographical Journal* (Oct., 1909).

AUSTRALIA

THE CAPITAL OF THE AUSTRALIAN COMMONWEALTH. After some years of discussion, the location of the capital of the Australian Commonwealth has at length been selected. The site chosen for the capital town is at Canberra on the Molonglo tributary of the Murrumbidgee R., in New South Wales, about 300 miles to the southwest of Sydney. The federal district surrounding the capital is about 1,000 square miles in extent and includes the entire basins of the Cotter, Molonglo and Queanbeyan rivers. In fact, the leading consideration in the choice of land for the capital and federal district was the water supply, and it is believed that the catchment area selected will provide all the water required

for every purpose. The port of the capital will be built at the south end of Jervis Bay, about 100 miles east of the federal territory, and a route for a railroad between the port and the capital has been selected. The present population within the district is only about 4,000. The region is beautifully diversified by hill and valley and the general elevation is from 1,800 to 2,000 feet. The capital will be some 100 miles south of the railroad between Sydney and Melbourne and a branch road from the main line will pass through the federal district. Joint legislation by the Australian Parliament and the legislature of New South Wales were required for the transfer of the territory to the federal government.

POLAR

MR. LEFFINGWELL IN ALASKA. A letter to the Bulletin from Dr. C. W. Leffingwell, father of the explorer Ernest DeK. Leffingwell, reports that a communication from his son, written on Nov. 1, 1909, says that he had landed his stores safely on Flaxman Island, north coast of Alaska, and with the aid of two white men and some Eskimo had put up a small house, 16 by 24 feet, adjoining his old camp. This will furnish a comfortable shelter, being banked up with snow blocks, and will give protection to his instruments and papers. He will continue his geodetic and geological work on the north coast of Alaska for two or three years more, the expedition being at his own cost. His camp is not far from the Canada line, and possibly the overland surveyors of the line may be able to compare notes with him, next summer. He will make some very careful observations, with good instruments, to establish some point of longitude on the coast, more accurately than has heretofore been done.

THE NEW SCOTTISH ANTARCTIC EXPEDITION. Dr. W. S. Bruce was the leader of the *Scotia* Antarctic Expedition whose scientific results have taken high rank as important contributions to our knowledge of the Antarctic regions. On March 17 last, he addressed the Scottish Geographical Society on the new expedition which he hopes to lead to the Antarctic regions next year (*Scot. Geog. Mag.*, April, 1910). It is hoped that the expedition will leave Scotland about May 1, 1911, reaching Buenos Aires about June 20. It will sail thence for Cape Town, steering a zigzag course between 40° and 50° S. to supplement the bathymetrical survey of the South Atlantic begun by the *Scotia* in 1902-04. From Cape Town the party will steam direct to the Sandwich group, making soundings to try and prove the connection of the hypothetical "Rise" joining the Sandwich group and Bouvet Island, as well as the "Scotia Rise," discovered by the Scottish expedition in 1904.

The expedition will then steer from the Sandwich group for Coats Land with a view to erecting a house and landing 10 or 12 persons there. As there appeared to be no suitable landing place along the 150 miles of Coats Land discovered by the Scottish expedition in 1904, the expedition may have to go farther west or, possibly, as far east as Cape Ann, Enderby Land.

After landing the sledge party, the ship will proceed to Melbourne, steaming in as high a latitude as possible to take soundings and make deep sea research with a special view to determining former continental connections. The ship will winter at Melbourne.

In the spring, a sledge party, under Dr. Bruce, will attempt to cross the Antarctic Continent from Coats Land to Ross Sea, by way of the South Pole. At

the same time, the ship will sail southeast from Melbourne to Victoria Land (Ross Sea) and will send a party south over the ice barrier with supplies for Bruce's sledge expedition. It is likely that the two parties will meet near Beardmore Glacier, up which Shackleton pushed his way towards the South Pole, a little over a year ago.

The two parties will then rejoin the ship, proceed to Magellan Strait or the Falklands, and carry on oceanographical research in as high a latitude as the winter season will permit. In the spring, the expedition will enter Weddell Sea again to relieve the wintering party that will then have spent two years there. This party, in the absence of the ship and Bruce, will have exerted itself to survey the coastline of Antarctica both to the east and west of the station. The expedition will carry complete meteorological, magnetic, and other physical and biological outfit. The cost will be about \$250,000.

SIR ERNEST SHACKLETON'S PLANS. According to the *London Times* (Weekly Edition, March 4, 1910) Sir Ernest Shackleton said, just before his departure for America, that if he should decide to start, at a later date, on another expedition to the South Polar regions, the work he would undertake would probably be the exploration of the region between Cape Adare and King Wilhelm II Land. This apparently means that he would undertake to establish the coastal limits of the Antarctic Continent to the west of Cape Adare as far as Gaussberg, the mountain near which the Drygalski (German) expedition wintered. The land back of the mountain was found steadily to rise towards the interior. The Germans advance good reasons for their belief that this land is a part of the continent and to this region they attached the name of their Emperor. The region between Cape Adare and Kaiser Wilhelm II Land is the area which has long been shown on Antarctic charts as Wilkes Land, so called in honor of Lieut. Charles Wilkes, the commander of the United States expedition which, in 1840, skirted what Wilkes believed to be the border of a very extensive land to which he gave the name of the Antarctic Continent.

TEMPERATURES, PRESSURES, AND THE HEIGHT OF THE ANTARCTIC CONTINENT. Comment on Dr. Wilh. Meinardus's paper "Die muthmassliche mittlere Höhe des antarktischen Kontinents" appeared in the *Bulletin* for February, 1910 (pp. 125-6). Professor R. DeC. Ward, of Harvard, sends us the following in which he presents the temperature results obtained both by Meinardus and Hann:

"Dr. Meinardus considers Antarctic temperatures and pressures and the probable height of the Antarctic continent as indicated by these pressures. The same writer had previously determined the mean annual, January and July temperatures between latitude 60° S. and the South Pole ('Die Lufthülle,' in A. Scobel's *Geogr. Handbuch*, 5th ed., 1909, p. 74). The results obtained by Meinardus and Hann, for the mean temperatures of the south polar area, beyond the Antarctic Circle, are as follows:

MEINARDUS.			HANN.			MEANS.		
Jan.	July	Year.	Jan.	July.	Year.	Jan.	July.	Year.
27.1°	-13.4°	1.9°	25.3°	-15.5°	3.7°	26.6°	-14.8°	3.2°

"As these mean temperatures were determined by interpolation upon the basis of few data, the close agreement is very satisfying. Dr. Meinardus's conclusions regarding the altitude of the Antarctic continent are as follows:

"1. On the basis of the seasonal interchange of air over the known portions

of the earth's surface we may assume that over the South Polar area (within the Antarctic Circle) the *actual* pressure in January is about 11 mms. higher than in July.

"2. The observations hitherto made in the higher southern latitudes give sure evidence that the sea-level pressure is higher in January than in July. The decrease in the meridional temperature gradient, and the resulting decrease in the easterly winds at the margin of Antarctica in summer, make it probable that the pressure reduced to sea-level is lower in summer than in winter. This would be a situation similar to that which actually exists in the North Polar area.

"3. The pressure excess of 11 mms. can easily be explained if the South Polar area is elevated.

"4. A mean altitude of the South Polar area of about 1350+or-150 meters can bring about the above-mentioned pressure excess.

"5. If we assume that the land area within the Antarctic Circle embraces 14,000,000 sq. kms., the mean altitude may be fixed at about 2000+or-200 meters.

"6. The observations of altitudes around the margins of the Antarctic make it seem possible that the mean altitude of the continent is considerable.

"7. The thickness of the ice cover plays an important part in the mean altitude, as is the case in Greenland."

CARTOGRAPHY

THE MAP OF THE WORLD IN 1:1,000,000. In accordance with the action taken at the Ninth International Geographical Congress, in Geneva, the British Government sent out invitations to the various countries interested to send delegates to a meeting to be held in London, on Nov. 16 last, for the purpose of deciding upon the details essential to the preparation of a uniform map (*Bull.*, 1909, p. 765). The countries represented were Austria-Hungary, Great Britain, France, Germany, Italy, Russia, Spain and the United States. The delegates from the United States were Mr. Bailey Willis, geologist, of the U. S. Geological Survey and Mr. S. J. Kübel, chief engraver of the Survey.

The initial meridian of Greenwich was adopted. The metric system was adopted with the provision that the scale of heights and distances may also be expressed, in addition to the metric system, in terms of miles or of any other unit. Conventional symbols for representing water courses, roads, railroads, towns, cities, etc., were agreed upon, the result embodying nearly all the conventions used on the maps of the U. S. Geological Survey. The Latin alphabet alone may be used in writing names, but the spelling shall be that of the official maps of each country. The adopted spelling for China is that of the post and customs service.

The representation of topographic relief will consist, in the main, of generalized contours so drawn as not unduly to obscure other features of the map. Shading will be used to bring out features that cannot adequately be shown by contours. Color effects also will be used to show the distribution of altitudes and sea depths more vividly. Shades of blue will denote different depths of lakes and seas; three tints of green will indicate low lands from sea level to 300 meters; pale buff will then be used up to 500 meters, followed by browns growing darker up to 3,000 meters; then come violet tints fading into white at the highest elevations above 7,000 meters.

Since the ocean covers three-fourths of the earth, the atlas is not likely to comprise over 1,500 sheets, including the oceanic islands.

The sheets falling to the United States, south of Canada, including slices of the oceans, Canada and Mexico, will number 52. Mr. Bailey Willis, in an article on the International Map (*Nat. Geog. Mag.*, Vol. 21, pp. 125-32), says that the U. S. Geological Survey has now 9 of these sheets in preparation, covering parts of the eastern, central and western states. They are being drawn on a scale of 1:500,000=7.8 miles to an inch. They will be reproduced, by photolithography for publication on a scale of 10 miles to an inch and, as Congress provides the funds, will be published on the scale of the International Map—1:1,000,000. Mr. Willis says: "It is to be hoped that the task may be prosecuted with energy, and that the first edition of the one-millionth map of the United States, as a part of the standard map of the world, may be engraved and published within ten years."

EDUCATIONAL GEOGRAPHY

SCHOOL GEOGRAPHY IN THE UNITED STATES. The report of the Committee of the National Educational Association, made in July last, has been published in the *Journal of Geography* (Vol. VIII, pp. 1-9). The report criticised the high school course in physical geography because it places too much emphasis upon the detailed study and classification of land forms, and too little upon human response to those forms; the concrete study of human response to its environment does not receive sufficient attention; the course aims to fit the student for college rather than for the affairs of life.

Secondary school geography does not give the student a grasp on natural resources, industries and commerce; as at present constituted, it cannot give the student an adequate knowledge of regions and peoples.

The Committee then presents as the essentials of a course in geography for secondary schools, those parts of mathematical geography showing how human life is influenced by the relations between the earth and other members of the solar system; atmospheric phenomena; the ocean as a modifier of climate, as an agent in the destruction and construction of land forms, as a source of commodities, and as a commercial highway; the larger geographic forms, such as plains, mountains, rivers, lakes, glaciers, etc.; the larger resources of our country, such as soils, waterways, water powers, forests and mineral wealth; the geography of the most important countries and peoples; the shaping of history by geographic conditions; the relationships between geographic forms and geographic processes; and the responses which human life makes to its physical surroundings.

The Committee recommends that Geography be a required subject in all secondary schools to be pursued not less than one year. It should also be presented during the first year of the high school course. There should be at least five recitation periods per week and one-fourth of the total time should be devoted to laboratory and field work.

LAWRENCE MARTIN.

GEOGRAPHY IN GERMANY. A conception of the scope of the work in geography given at the German universities may be gained from a perusal of the titles of recent geographic theses prepared for the degree of Doctor of Philosophy. The following are in part taken from the "Jahresverzeichnis der an den deutschen Universitäten erschienenen Schriften" published by Behrend & Co., Berlin, where

further details as to exact title, author, etc., may be found. The theses may be grouped according to subject matter under the following headings:

Physiography. On the Sierra Nevada of Spain (Berlin, 1908); The Status of Armenia in the Highland of Western Asia (Berlin, 1905); The Development of the Conception of the Term "Coast" (Leipzig, 1904).

Oceanography. The California Current (Göttingen, 1909).

Meteorology and Climatology. The Hurricanes of the West Indies (Bonn, 1907); The Climate of Davos, Switzerland (Heidelberg, 1907); The Meteorologic Equator in the Pacific Ocean (Göttingen, 1906).

Cartography and Cartometry. The Mensuration of Geographic Surfaces before the Invention of the Planimeter (Göttingen, 1906); The Theory of Isocronal Lines and their Cartographic Representation (Königsberg, 1908); The Mean Altitude of Asia (Kiel, 1906); A New Calculation of the Surface of the Continental Slope (Göttingen, 1909).

Anthropogeography. The Influence of Summer Resorts on the Density of Population and the Means of Communication in the Northwestern Thüringen Wald (Jena, 1908); Town Sites of Eastern Germany (Kiel, 1907); The Upper Limit of Human Habitation in Switzerland based on the Distribution of the Chalets (Bern, Switzerland, 1906); Bodin's Theory of the Influence of Geographic Position on the Political Life of Nations (Bonn, 1904); The Density of Population in the Northwestern Lowland of India (Göttingen, 1909).

Commercial Geography. Commercial Geography of Saxony (Jena, 1908); The Importance of Beasts of Burden in Africa (Jena, 1908); On the Railroads of the French Colonies (Jena, 1908); The Commercial Utilization of the Topography and Position of Ireland (Rostock, 1908); The Development of the Lines of Communication in Australia (Leipzig, 1906); The Passes of the Western Carpathians (Leipzig, 1906); Paths and Trails geographically considered (Leipzig, 1906); Commercial Geography of South Africa (Jena, 1905); Canada and the Hudson Bay Co.

Discovery and Exploration. The Discovery and Explorations of the Australian Coast and the Islands of the Pacific Ocean by the French from 1783 to 1830 (Bonn, 1907); History of the Discovery and Exploration of Greenland up to 1800 (Erlangen, 1906); Exploration of the Mainland of Indo-China by the Jesuits at the beginning and close of the Seventeenth Century (Würzburg, 1905); The History of Discovery and the Cartography of Africa up to 1749 (Munich, 1905).

Regional Geography. The North Brazilian Coastal State Ceará (Bonn, 1908); The History, Nature and Importance of the Island of Sachalin (Bonn, 1907).

Development of Geography and its Methods, and Biography. Geographic Courses at the former University of Altdorf (1623-1809) (Erlangen, 1908); Julius Fröbel's Investigations of the Methods and System of Geography and of their Place in the Development of Geography as a Science (Halle, 1908); Karl Ernst von Brun as geographer (Munich, 1908); Malte-Brun, France's Foremost Geographer in the first quarter of the Nineteenth Century (Leipzig, 1908); James Rennell, the Creator of Modern Geography in England (Leipzig, 1904); The Teleologic Bent of Karl Ritter's Mind (Leipzig, 1905); Alfred the Great as Geographer (Munich, 1904).

W. JOERG,

SUMMER FIELD WORK IN PHYSIOGRAPHY. Professor W. M. Davis will lead a party of students this summer, in physiographic field work in Colorado. The work will be open to students (men only) who already have some knowledge of physiography. It will begin at Denver, on July 6, six days a week, for two or three weeks, and will be extended by individual field work to five or ten weeks by those who wish to count the course towards a Harvard degree. The object of the course is to study parts of several ranges of the Rocky Mountains in Colorado, with particular attention to the best methods of describing the forms observed. Those who wish to attend this course should address Prof. W. M. Davis, 17 Francis Ave., Cambridge, Mass., stating the work they have already done in physiography.